



Processing Analytical Data Using the Redesigned USDA Nutrient Data Bank System

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Abstract

Objective: To illustrate the management of analytical data using USDA's redesigned Nutrient Data Bank System (NDBS).

Methods and Materials: The redesigned NDBS is a relatively new, complex database management system. The USDA National Nutrient Database for Standard Reference (SR), Release 14, was the first SR release to utilize the redesigned NDBS in 2001. The NDBS integrates the nutrient data through a series of processes from data acquisition to dissemination. The first step is the electronic migration or manual entry of data. Detailed information about the food sampling and handling, data sources, analytical methodology and quality control, weights, and components is documented during this step. Acceptable data from different samples are then aggregated. Comparison reports and outlier tests help evaluate the data before they are aggregated. The final step is compilation which results in the finished food item that's ready for dissemination. The NDBS has the capability to perform various imputing calculations at this step. A step-by-step example is shown to demonstrate some of the details involved from the initial to the compiled stage.

Results: An enhanced SR is the current product of the NDBS. Analytical data can easily be viewed and compared, enabling food specialists to produce a more complete and accurate database product. Nutritionists are able to process data in a more timely manner and documentation is more organized and complete.

Significance: The management of food composition data relies on the availability of comprehensive data management software which facilitates the documentation, handling, and dissemination of large amounts of data for diverse types of food.

Initial step

• Data are either migrated from a spreadsheet using an Oracle script or manually entered into the NDBS.

• Documentation includes laboratory or publication details and sponsoring organization. Sampling plan identifies pick-up location, region, and season; sample handling includes homogenization details.

• This composite is made up of several subsamples (nutrient data from various labs) and sample units (pickup locations).

Nutrient data details captured at this stage include the date and method of analysis; limits of detection and quantification; source codes and derivation codes.

Aggregation step

• Data are brought in from all available reliable sources.

• Nutritionist can compare and evaluate the nutrient values visually and by using built-in statistical outlier tests. Any values determined to be unacceptable may be rejected by checking the "Reject Flag" box.

Once all data are reviewed, the nutritionist clicks the "Aggregate" button. The resulting report shows the means for each nutrient, along with other statistics.

Compilation step

• At the compilation stage, the nutritionist brings in the aggregations with the data to be disseminated. Nutrients can still be rejected at this point.

• Any missing nutrients may be imputed now. There are several imputing methods from which to choose. For raw cranberries, fatty acids were imputed from currants.

The finishing touches are added on the compiled nutrient tab. The NDBS calculates fatty acid sums, carbohydrate, and energy. Footnotes may be added here. QC checks are run before food specialist can check FS Approved; an item is sent for Technical Review (check TR Approved) prior to dissemination of item in SR.

In the future, data quality indicators will be added.

